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AUTHOR Hollenbeck, Albert R.; And Others
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ABSTRACT

Response patterns of 24 female nurses to 2-day-old neonates who had been arbitrarily labeled male or female were studied. A total of 17 reliable behaviors of nurses were scored from videotapes of nurse-infant interaction. Nurses responded differentially to neonates based on true gender rather than ascribed gender. Nurses held boys more by their torso and girls more on their laps, and used more nonvocal sounds with boys than with girls. Nurses' responses to neonates who were arbitrarily labeled for gender were inconsistent. It is concluded that these findings have implications for gender role socialization theories that incorporate differential treatment as an explanation for later gender differences. (Author/RH)

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Nurses Behave Differentially to Neonates in Terms of their True Gender Compared to their Ascribed Gender

Albert R. Hollenbeck
American Association of Retired Persons

Jacob L. Gewirtz
Florida International University

and

John W. Scanlon
Georgetown University Medical School

PS 018510

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Abstract

An investigation was made of female nurse (N = 24) response patterns to two-day-old neonates, arbitrarily labeled male or female. Seventeen reliable nurse behaviors were scored from videotapes of nurse-infant interaction. The nurses responded differentially to the neonates based on true gender rather than ascribed gender. Nurses held boys more by their torso and girls more on their laps, and used more nonvocal sounds with boys than with girls. Nurse responses to neonates arbitrarily gender labeled were inconsistent. These findings have implications for gender-role socialization theories that incorporate differential treatment as an explanation for later gender differences.

Introduction

One persisting assumption in the child-rearing literature about adult behavior toward infants is that of gender-differential treatment. As usually advanced, this assumption is that adults respond differentially to children depending on the child's gender, and that this, in turn, accounts for later differences in the behavior of boys and girls. The investigation being reported was mounted to determine whether or not, as surrogates for parents and other society members, neonatal nurses (all were mothers experienced with neonates) behave differentially to two-day-old neonates depending upon baby gender, true or ascribed.

In a review of the child-rearing literature of the differential socialization of boys and girls, Maccoby and Jacklin (1974) concluded that there were few differences in parental treatment of boys and girls. In a review of the post-1973 literature, Huston (1983) concluded that the more-recent research provided stronger support for differential treatment of boys and girls, although gaps in the literature still existed. In contrast, Siegel's (1987) combined qualitative and meta-analytic review of the post-1973 research reports little evidence of maternal differential treatment by gender. In a more-narrowly focused review, Stern (1986) examined the research on gender-label effects as evidence for early sex-role stereotyping and concluded that gender-labeling effects were not as consistent as portrayed in developmental textbooks and that, when individuals react to infants based on a gender label, their behavior is tempered by a number of complex factors. Thus, these reviews indicate that the evidence for sex-differential treatment is far from conclusive.

One of the assumptions of the sex-differential treatment hypothesis is that gender-role socialization begins at birth and continues through the early years. Few researchers have examined the differential treatment by adults or the effects of gender labeling of neonates on adult behavior to them. Of the 26 reports identified by Stern and the additional reports noted by Huston, only one (Rubin, Provenzano, & Luria, 1974) examined parental perceptions of neonate sex differences reporting that boys were seen as robust, strong, and large-featured, while girls were seen as delicate, fine-featured, and soft. The other reported studies employed infants ranging in age from 3 to 17 months in general finding that gender-labeling effects were not consistent. Similarly, of the studies specific to gender labeling, only 11 examined adult behavior through an interaction paradigm and none of these studies used neonates, the youngest infants studied being three months old. These studies found that when adults interact with infants and behavioral measures were employed, the gender-labeling effects were sometimes detected, sometimes not detected, or sometimes inconsistent with the direction of original hypotheses. An often-cited study (Condry & Condry, 1976) reported differences in adult ratings of a 9-month-old infant by ascribed gender, but few of the outcome-measure differences were significant. Similarly, a gender-label effect on response to crying was reported when college students were exposed to an audiotape of a waking infant with gender ascribed (Condry, Condry, & Pogatshnik, 1983). Adult females responded more quickly to the "girl" than the "boy", and adult males responded equally slowly to both.

The available research has not addressed the overlapping questions of sex-differential treatment of infants from birth or of effects of gender labeling of neonates on adult behavior to them. The aim of the present study is to compare the response patterns

to two-day-old neonates of neonatal nurses, as surrogates for parents and society, when the neonates presented to them for interaction are arbitrarily labeled male or female. As was noted, there exists no strong evidence to document that adults behave differently to boy and girl infants, much less boy and girl neonates two-days old. This study was designed to remedy this deficiency through direct experimental manipulations in the absence of anatomical gender cues.

Method

Subjects

Subjects were 24 female nurses and nurse assistants working in the Special Care and Neonatal Nurseries of the Columbia Hospital for Women, Washington, D.C., who were experienced in caring for neonates. Subjects were selected from a different nursery service than the infants who served as stimuli, to preclude potential prior knowledge about particular neonates. Nurses were probed on their knowledge about stimulus infants on other services, and none had to be rejected. Mean nurse age was 32.3 years (SD = 9.8), mean years of education was 14.3 (SD = 1.9), and mean number of offspring per nurse was 1.0 (SD = 1.5). Twelve nurses were black, 8 Caucasian, and 4 oriental or East Indian.

Stimuli. Neonates delivered without serious complications served as stimuli in the study. All neonates were full-term and healthy, delivered under epidural (local) anesthesia, natural child birth, or C-section conditions, and less than 72 hours postpartum (most were two days postpartum, the mean being 49.29 hours). Male neonates were uncircumcised. Any medical complication during delivery or the hospital stay prior to assessment for either mother or stimulus infant was used as a basis for exclusion. Twenty-four neonates served as stimuli for the nurses. Neonate characteristics are listed in Table 1.

Design and Procedure

The pediatric nurses were told that a stranger neonate with whom they were to interact was either a boy or a girl, regardless of its true gender. Each stimulus neonate served so that it could be labeled once as a boy and once as a girl with different nurses on a random basis. Each subject nurse was exposed to one of eight presentation orders of neonate stimuli: (1) true male/false male, (2) true male/false female, (3) true female/false female, or (4) true female/false male. Order of presentation was counterbalanced to yield four additional presentation conditions with orders reversed: (5) false male/true male, (6) false female/true male, (7) false female/true female, or (8) false male/true female. Each of the eight presentation orders was replicated with three nurse subjects. In all, 24 nurse subjects were employed in the experimental design that is schematized in Table 2.

On observation days, project staff entered each of two nurseries located on different floors of the hospital, and selected infants that were to serve as stimuli that day. An optimal observation time was determined based on the routines of the nursing staff, hospital, and mothers. Mothers were then contacted, the general study purpose explained, and informed consent obtained. Following neonate selection, nursing staff on another floor and service were targeted for selection as subjects. Nursing staff were then contacted, the study purpose explained as an investigation of nurse-neonate interaction, and informed consent obtained from them. A subject nurse was then brought to the observation room where a video camera was in full view. An assistant then went to the nursery, checked that the infant had been fed, diapered, and was in an alert state. Each nurse was instructed to "get to know this baby for a short period." They were also asked not to undress the baby because of problems due to potential body-heat loss. The infant was then brought to them with name and I.D. tags masked and introduced as having a male or a female name, as either baby "Edward Lilly/Lilly Edward" or "James Joyce/Joyce James," based on treatment-condition assignment. The nurse subject was then instructed to start to get to know the neonate. The interaction was terminated when

three minutes had elapsed. The stimulus neonate was then returned to its nursery, while the subject nurse waited. A second neonate was brought in several minutes later, and the procedure repeated. Finally, each nurse was debriefed by (a) allowing her to ask questions and (b) explaining the importance of her not discussing any aspect of the study with anyone else in the hospital. A manipulation check was not performed to avoid possible contamination of the gender deception. No nurse asked directly about the true gender of any infant. Mothers were debriefed in a similar fashion and, when requested, allowed to view the videotape of the nurse with the neonate.

Videotape scoring. Twenty-eight nurse behaviors selected as a comprehensive set of adult behaviors in interaction with neonates from prior research were scored from the videotapes by trained observers. Table 3 lists the behaviors scored. Behaviors were scored present or not during each of 18 successive 10-sec. intervals, prompted by a tape-recorded audio cue. Observations began when the experimenter instructed the nurse "to start" on the videotape. Observations terminated after 180-secs. This procedure yielded scores ranging from 0 to 18 for any behavior.

Two observers were trained independently to a percentage agreement >80% on each category using a training tape. Both observers scored every videotape independently. Percentage agreement scores between observers for each of the 28 behavior categories ranged from 57% to 98%. Overall agreement across all behaviors in all observation sessions was 88%. The mean of the individual scores on each behavior for the two independent observers was used in all subsequent analyses. Eleven behavior categories were discarded because of low occurrence rates and/or poor observer agreement, leaving 17 categories to be employed in the analyses that follow.

Results

The examination of order of presentation, true-gender, and gender label, any one of which was confounded with the other two in the design, was not possible in a single analysis. Thus, the analysis plan was separated into two analyses a gender label analysis and a true-gender analysis.

Gender Label Analysis

Analysis plan. The analysis was conceptualized as an *Order* of presentation (2) by *Gender Label* (2) repeated measures Multivariate Analysis of Variance (MANOVA). MANOVA was employed to examine *Order* effects and to simplify the computational task of examining contrast means. *Order* was a between-subjects factor while *Gender Label* was a within-subjects factor. Results of this MANOVA analysis for the 17 adult-behavior categories serving as dependent variables yielded neither a reliable (at $p < .05$) *Order* main effect nor an *Order-by-Gender-Label* interaction effect. the overall test of the within-subjects factor (*Gender Label*) was of no interest since the mean contrasts were to be examined directly (e.g., Bock, 1975; Harris, 1985). In the absence of an *Order* effect, the analysis was recalculated pooling the *Order* with the *Gender Label* effect as the within-subjects factor.

Gender Label results. Four planned comparisons were made for each of the 17 dependent variables true boy vs. true girl; false boy vs. false girl; true boy vs. false boy; and true girl vs. false girl. For each dependent variable the within-subject error term was used to test hypothesized subgroup mean differences using the Bonferroni approach to controlling experimentwise error rate (Harris, 1985). Thus, each dependent variable was examined at $p < .05$-experimentwise, while each mean contrast was examined at $p < .012$. It should be recalled that comparisons are based on different nurse subjects ($d.f. = 23$) in the design employed in the study. Table 4 presents significant mean-difference results.

One difference was detected between true boys and true girls: nurses used *nonvocal sounds* more with true boys than with true girls. Comparing false boys (i.e., girls) with false girls (i.e., boys), three differences were detected: nurses *held by the torso* false girls more than false boys; nurses *held in their laps* false boys more than false girls. Comparing true boys vs. false boys (i.e., girls), two differences were detected: nurses *held by their torso* true boys

more than false boys; and nurses *held on their laps* false boys more than true boys. No effects were found for any of the other reliable observed behaviors under any of the comparisons.

True-Gender Analysis

Analysis plan. When conceptualizing this study, an hypothesized MANOVA test of real gender differences (true neonate gender regardless of label) was planned. Nevertheless, the design employed did not generate an unambiguous classic error term to test this difference. Different neonates are used as stimuli both between and within subjects. Nevertheless, relying on the robustness of the MANOVA to provide meaningful estimates of error parameters when assumption violations occur (Bock, 1975), the within-subjects error term was again selected as the best available estimate of error for mean comparisons. To guard further against chance results, conservative Scheffe comparisons were employed rather than using a Bonferroni approach even though the contrasts were planned comparisons.

True-gender results. After carrying out the MANOVA analysis, three of the 17 reliable nurse-behavior means were different (at $p < .05$) when real boys were compared to real girls (See Table 5). The pattern of reliable mean differences involved nurses *holding* girls more than boys *in their laps* and, in contrast, *holding* boys more than girls *by the torso* while emitting *nonvocal sounds* more to boys than to girls.

Discussion

The pattern of findings summarized in Table 5 indicates that, as early as two days post partum, neonatal nurses treat neonates differently according to true gender, independent of how the neonates were gender labeled. While the true gender cues the nurses used are not obvious, the discrimination could have been based on behaviors, odor, or face/head appearance cues. These results are generally compatible with those of Gewirtz and Hernandez (1984, 1985), who reported that untrained adults were able to discriminate the genders of groups of one-day-old neonates from live faces/heads, and that both adults and children between the ages of three and six could make such gender discriminations from slides, reliably better than binomial chance. Since nurses in the present study interacted directly with the babies, they might have based their discriminations on behavioral, appearance, and/or odor cues. (It is incidental to the interpretation of these findings that, in the Gewirtz and Hernandez study, the gender discrimination was detected using only still photographic stimuli, where neither odor nor behavior cues could possibly have been the bases of the discrimination.)

The specific finding that nurses emit *nonvocal sounds* more to boy than girl neonates is not consistent with the gender-labeling literature where it has been reported that adults talk more to girls one to six months of age (Goldberg & Lewis, 1969) or where no differences have been found in infants four months and older (Field, 1978; Lamb, 1977). At the same time, the finding that nurses hold boys more by torsos and girls more in their laps has not been reported previously.

The findings summarized in Table 4 mirror the pattern of inconsistencies generally reported in the gender-labeling literature for older infants. Here, the emission of *nonvocal sounds* by nurses was directed more toward boy than girl neonates. While the opposite pattern was reported for infants one to six months-of-age (Goldberg & Lewis, 1969), there was also reported a case of no gender difference in talk to boys and girls four to 13 months-of-age (Field, 1978; Lamb, 1977). Another inconsistent neonate pattern found in this study is that girls (labeled "boys") were held differently than boys (labeled "girls"), more in the nurses lap and less by the torso, regardless of gender labeling. No non ad hoc explanation is readily apparent for this finding.

In contrast to the inconsistent gender-label effects noted here, the dramatic results based on the true-gender analysis have implications for theories that employ sex-differential treatment as an explanation for sex-typed socialization. These results suggest that there is sex-differential treatment based on the true gender of neonates regardless of any gender label that may be applied. Experienced nurse caretakers appear differentially to respond to cues reflecting the "maleness" or "femaleness" of

neonates rather than to the stereotypes evoked by the labels male and female. By extension, nurses and other adults would behave similarly where there is no ambiguity as to neonate gender. This finding is compatible with the assumption that the neonate is as much the elicitor, as the recipient, of differential treatment. For a finer-grained learning analysis, the data imply that, from early life, different contingency patterns are provided for boy and girl behavior by adults responding to gender-associated cues. In the present study, these cues are not identified. It remains for future research to identify such cues as a basis of the genesis of sex-differential behavior directed toward both neonates and infants and the subsequent development of gender-specific neonate and infant behaviors.

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Table 1

Demographic Characteristics of the 24 Neonates Presented to Nurses

Gender:	Male = 12, Female = 12
Race:	Caucasian = 9, Black = 15
Length:	*M* = 49.67 cm, *SD* = 2.43 cm
Weight:	*M* = 3176.08 gms, *SD* = 425.30 gms
Age:	*M* = 49.29 hours, *SD* = 10.96 hours
Delivery Type:	Epidural = 6, Natural = 4, C-section = 4

Maternal Age:	*M* = 28.21 years, *SD* = 5.79 years
Maternal Education:	*M* = 14.58 years, *SD* = 3.59 years

Table 2
Experimental Design and Sample Sizes

		Ascribed Gender		
		Male	*Female*	*Total*
True Gender	Male	6 (True) 6 (False)		12
	Female	6 (True) 6 (False)		12
	Total	12	12	24

Table 3
Adult Behavior Codes and Definitions

1. Torso: Holds baby close to body or face at torso level, with either or both hands.

a2. Shoulder: Holds baby close to body with portions of baby's head higher than adult's shoulder, with either or both arms.

3. Arms extended: Holds baby with arms extended, but only if baby's body or body part is NOT in contact with adult.

a4. Arms overhead: Holds baby at arms' length overhead.

5. Lap: Holds baby on lap or legs. May also be on upper abdomen in obese adult (functional lap).

a6. No contact: Puts baby down, out of gross bodily contact with adult.

7. Reposition: Repositions baby while maintaining contact category. Must include shift of infant center of gravity or axis of body. Does not include shifting of extremities alone.

8. Jigs body/Rocks: Jiggles baby's whole body (rapid, jagged cycles within relatively short episodes), while adult's body does not move or moves minimally. Also score if adult rocks the baby with her body. In either case, the infant's whole body must be involved.

9. Holds/Touch: Score if adult fingertip touches infant without a distinct stroking motion, or if adult holds infant body part without moving it across the entire time block.

10. Pats: May use fingers, palms, or both, but must cycle on and off body at least twice.

11. Strokes: Fingers are used with active lateral movement.

12. Jiggles part: Score when adult jiggles infant's body part or when adult holds body part briefly then releases it. If body part is held and stroked with movement of the part, score jiggles, not stroke.

13. Extends finger: Score when adult finger is extended for infant to grasp. Continue to score whenever the infant is grasping the finger.

a14. Kiss: Score for kiss when lips or nuzzle with face.

a15. Hug: Hugs or places cheek to infant's cheek while holding baby or baby's arms.

a16. Burp position: Positions on shoulder or on lap and pats, fingers, or palms. Score only when the infant has been fed or there is verbal evidence of intention to evoke air bubble. Do not score lap or shoulder when burp position is scored.

a17. Feeds: Adult provides baby with bottle or pacifier.

18. Caregiving: Combs, diapers, grooms, rearranges clothing or blankets.

19. Looks-face: Fixates on infant face.

20. Looks-body: Looks at baby other than at face. Includes back and side of infant head. May be assumed when hands are involved with infant's body.

21. Looks-away: Looks away from infant face or body.

22. Smiles: Naso-labial facial folds deepen, cheeks may move upwards, eyes may squint.

23. Talks: Talks to infant.

24. Vocalizations-nonverbal: Includes clicking, clucking, cooing, and whistling.

a25. Laughs: Do not score smile when laugh is scored.

a26. Talks to another: The presence of another must have been clearly established. Eye contact with this other may be made while talking. Use of the third person while speaking of the baby suggests that this should be scored.

a27. Visual stimulation with body part: Visually stimulates intentionally with body part. Includes nod of head and attempts to catch baby's attention with finger movement as intended visual stimulus. If

head nod is to be scored, it must include lateral movement and/or vocalization to suggest intentionality of stimulation.
a28. Visual stimulation with object: Visually stimulates intentionally with object, such as spectacles, bottle. Does not include "reflexive" rearranging of spectacles, etc.

Note. The same behavior sequence can require multiple scoring as, e.g., *extends finger* for grasping and uses finger to *stroke* baby's skin.

aDeleted from analyses for low occurrence rates and/or poor observer agreement.

Table 4
Gender Ascription Comparison Mean Differences ($p < .01$)

	Gender Label			
	True Boy	True Girl	False Boy	False Girl
Variable				
n =	6	6	6	6
Nonvocal sounds	1.3*		00.4*	
Held by torso	03.6		01.1	03.2
Held in lap	13.9		16.6	13.3

*$p < .02$

Table 5
True-Gender Comparison Means (Different at $p < .05$)

	True Boy	*True Girl*
Variable		
n =	12	12
Nonvocal sounds	01.2	00.7
Held by torso	03.4	01.3
Held in lap	13.7	15.7

Author Notes

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